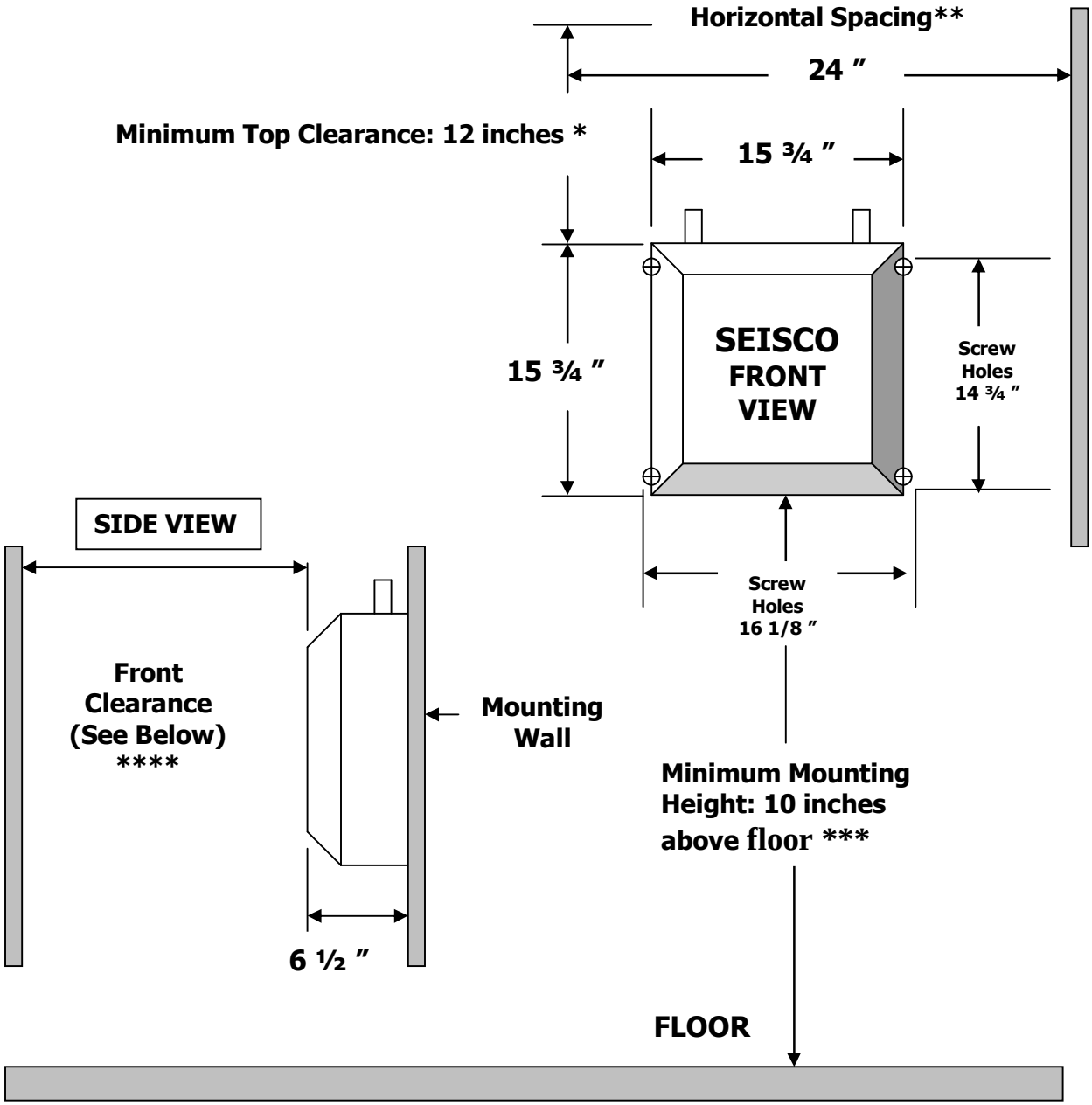
SEISCO® - MOUNTING CLEARANCES



* **Top Clearance :** For removal of heating elements and to provide room for plumbing connections, a minimum of 12 inches is required.

** **Side clearance :** Allow an overall minimum horizontal space for the heater of 24 inches for removal of protective cover screws and access to electrical wires entering the heater from the side.

*** **Mounting height :** For safety, ease of installation and service, the suggested height above the floor is 42 to 48 inches, (minimum 10 inches). Do not install electrical disconnect or sub-panels below heater as this may interfere with access to the clean out plates located under the heater.

**** **Front Clearance :** In the absence of a door or removal access panel in front of the heater, allow 32 to 36 inch clearance in front of the heater for protective cover removal and ease of service.

HUD Rules for Manufactured Housing

Where to Install

The Seisco water heater should be installed as specified in the Federal Manufactured Housing Construction and Safety Standards (Standards). This was further clarified in a letter from HUD, dated Aug. 1, 2000.

In summary, the Seisco water heater can be installed in any room, including closets, alcoves, utility rooms, and storage rooms, in which all walls and ceilings have a spread rating of 25 or less. Walls and ceilings consisting of unpainted or painted 5/16 inch or greater gypsum board or 5/16 inch or greater tape/textured gypsum board meet these flame spread ratings. When installed in such a room, the Seisco can be mounted at any convenient location and without any additional enclosure.

If any of the walls or ceilings in a room have vinyl covered gypsum board, 5/16 inch or greater, the room may not meet the flame spread index of 25 or less, for the purpose of installing the Seisco water heater. If one or more of the walls is paneling, the 25 or less flame-spread rating is not met. In these situations, the Seisco water heater can be installed if a surrounding enclosure is constructed of 5/16 inch or greater gypsum. Vinyl covered gypsum board that is labeled with a flame-spread rating of 25 or less is acceptable to use in the water heater compartment without any additional enclosure.

Prevention of Storage

When the Seisco water heater is installed in a closet, storage room or similar room, the area surrounding the appliance should be framed-in or guarded with noncombustible material such that the distance from the appliance to the framing or guarding is not greater than 3 inches. (When clearance required by the listing is greater than 3 inches, the guarding or framing shall not be closer to the appliance than the distance required by the listing.)

Clearance spaces surrounding the Seisco water heater are not required to be framed or guarded when:

1. the space is specifically design for a clothes washer or dryer;
2. dimensions surrounding the appliance do not exceed 3 inches; or
3. the home manufacturer affixes either to the side of the storage area or closet containing the appliance, or to the appliance itself, in a clearly visible location, a 3”X5” adhesive backed plastic laminated label or the equivalent which reads as follows:

“Warning”

This compartment is not to be used as a storage area. Storage of combustible materials or containers on or near any appliance in this compartment may create a fire hazard. Do not store any materials or containers in this compartment.

All Seisco water heaters shipped to Manufactured Home Builders will have a warning label as shown above on the exterior of the heater.

Temperature and Pressure (T&P) Valves

As of August 1, 2000, there is no longer a requirement to install a T&P Valve with the Seisco water heater. The HUD letter recognizes and accepts the Underwriters Laboratories, Inc. (UL) Standard 499 endorsing the National Electrical Code (NEC) as an appropriate standard to the installation of valves for temperature and pressure relief as mandated by Standard 3280.609(c). Since the Seisco water heater meets the requirements of UL 499 and NEC as a tankless water heater, there is no requirement for a T&P Valve when the Seisco water heater is installed in a Manufactured Home.

Also see - Water Heater Controls, National Electrical Code, NEC, 422-47
FPN: See Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems, ANSI Z21.22-986.

PLUMBING INSTALLATION GUIDE

PLUMBING CONNECTIONS

NOTE: This heater must be installed to meet the current National Electric Code, and any applicable Local Plumbing, Electrical, Heating and Air Conditioning Codes.

Places to avoid installing the Seisco heater are in a crawl space under a house or building, in the garage (in regions prone to freezing or high humidity) and in the attic (unless the attic has been converted to living space). Like most appliances in the home, it is important to protect the Seisco heater from exposure to damp, humid and freezing conditions. In these environments, condensation from sweating pipes above and near the Seisco heater can drip down onto the plumbing connections and/or into the heater. This may cause corrosion at the plumbing connections or on components and electrical connections inside the heater. If it is necessary to install the Seisco heater on the second floor or in the attic, a drip pan with a drain must be installed below the heater to avoid damage to ceilings, walls and floors in the event of a leak. A drip pan is normally required for storage tank heaters located in the attic or on the second floor as well.

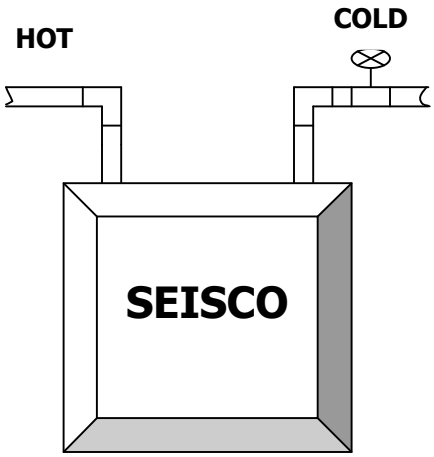
Unpack the heater from the shipping carton carefully. **DO NOT CUT THE SHIPPING CARTON WITH A SHARP INSTRUMENT.** Stand the unit upright and remove the plastic wrap. Locate the four (4) mounting holes in the metal back plate. Position the unit against the wall with the two inlet and outlet fitting tubes pointed up toward the ceiling. Refer to ***Mounting Clearances*** in this section of the manual. Make sure the unit is level and attach to the wall with ¼ inch or larger lag bolts that are at least 1 ½ inches long. If attaching to sheet-rock or paneling, anchors or molly bolts should be used to prevent the screws from pulling through the wall. If the heater is to be installed on a cinder block or concrete wall, attach a ½ or ¾ inch section of plywood (20" x 20 " square) to the wall first. Then use wood screws to attach the heater to the plywood.

ATTACHING WATER SUPPLY

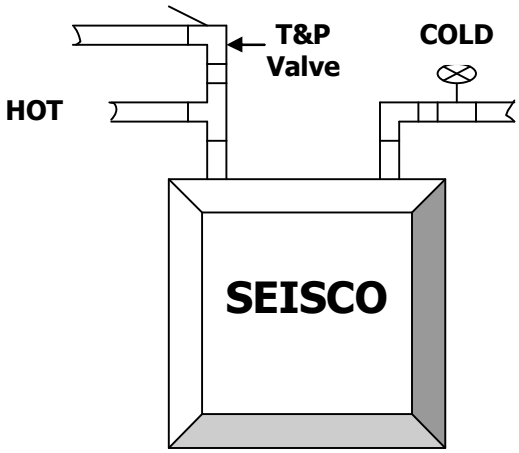
WARNING #1: Always use two wrenches when making any attachments of the water supply. Hold the heater's inlet and outlet fittings secure while attaching the cold water and hot water lines. Never attempt to attach water lines to the heater's fittings without using a second wrench to hold the fittings secure. The heater's inlet and outlet fittings are designed to turn freely.

WARNING #2: Never solder water supply lines to the heater's fittings. Heat from the soldering may damage the heat exchanger.

WARNING #3: Do not use Plumber's Putty or **PVC/CPVC primer and glue** on the threads of the heater's inlet and outlet fittings. Some of the putty compounds on the market are very aggressive and could potentially dissolve the threads on the heater's fittings. PVC/CPVC primer and glue will also dissolve the threads on the heater's fittings. Teflon Tape is the only sealer that should be used on the threads of the inlet and outlet fittings.



Above diagram shows approved plumbing connections without T&P Valve (T&P NOT REQUIRED BY MANUFACTURERER).



Above diagram shows plumbing connections with a T&P Valve if required by local codes.

TEMPERATURE & PRESSURE VALVE

A temperature and pressure relief valve (T&P Valve) may be required by local code. When a T&P valve is installed (which is not provided by the manufacturer), it should be checked after the water supply to the heater is turned on. With the water supply on, there should be no water flowing from the valve. Operate the valve manually two or three times to purge the trapped air from the top of the heater's chamber. **CLOSE VALVE.** Water should stop flowing completely prior to connecting the drain piping to the valve.

SINCE THE SEISCO HEATER DOES NOT UTILIZE A STORAGE TANK, THE USE OF A T&P RELIEF VALVE IS NOT REQUIRED BY MANY NATIONAL STANDARDS, INCLUDING UL STANDARD 499. Seisco heaters are designed with control logic as well as elctro-mechanical high limit thermostat switches for over-temperature protection. With these built-in safety features, the use of a T&P Relief Valve is not required.

DRAIN PAN

If the Seisco heater is installed in an area where water damage can occur to the area adjacent to the heater, a drain pan must be installed. The pan must be at least 1 ½ inches deep and large enough to protect the area below the heater (the pan should be at least 1 ½ inches larger than the lower external dimensions of the heater) and must be piped by 1 inch pipe to a suitable drain. A splash cover must be included to protect the area of attachment to the wall.

NOTE: THIS HEATER MUST BE INSTALLED TO MEET THE CURRENT NATIONAL ELECTRICAL CODE, AND ANY APPLICABLE LOCAL PLUMBING, ELECTRICAL, OR HEATING AND AIR CONDITIONING CODES.

ELECTRICAL INSTALLATION GUIDE

CONNECTION TO POWER SUPPLY

WARNING: Installation and service must be by qualified personnel only!
NOTE: This unit must be installed to meet the current National Electric Code, and any applicable local plumbing, electrical, heating and air conditioning codes.

Install wiring (see wiring diagram) from the unit to the Main Power Circuit Breaker Panel. Connect the wiring to the unit as shown on the wiring diagram attached to the inside of the unit's cover.

WARNING

MODELS RATED **14KW** THRU **28KW** REQUIRE MULTIPLE POWER SOURCES. WHEN WIRED DIRECTLY TO THE BREAKER BOX, THEY REQUIRE MORE THAN ONE DOUBLE POLE CIRCUIT BREAKER.

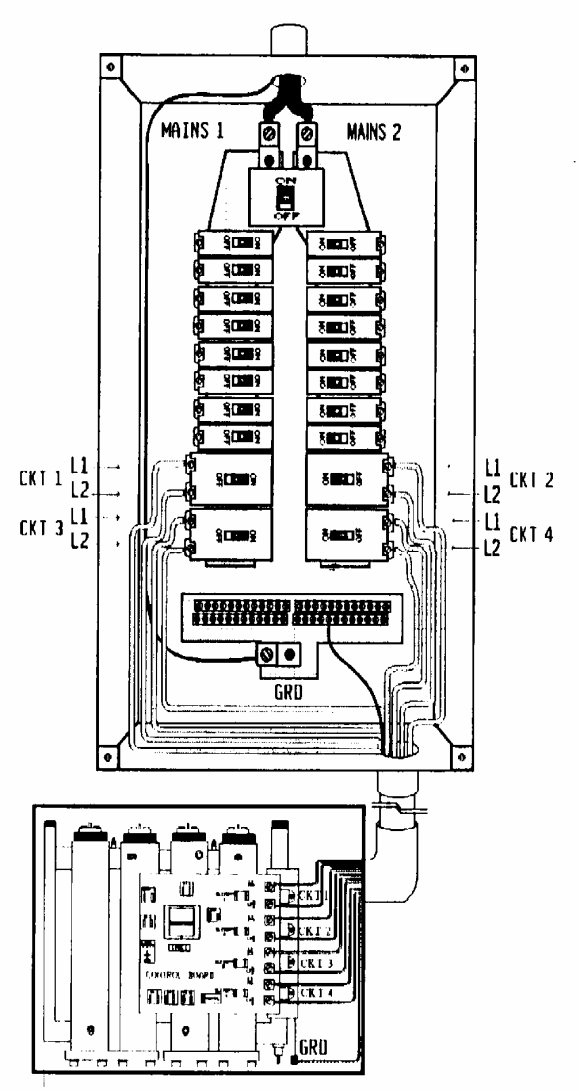
RISK OF ELECTRICAL SHOCK. HEATING ELEMENT IS NOT GROUNDED. SOME UNITS HAVE MULTIPLE POWER SUPPLIES. DISCONNECT ALL POWER SUPPLIES BEFORE SERVICING.

IF USING STRANDED WIRE, MAKE SURE THAT ALL STRANDS ARE IN SECURE PLACEMENT IN THE TERMINAL BLOCK. A LOOSE STRAND IN CONTACT WITH THE CIRCUIT BOARD CAN IMPAIR PERFORMANCE OR DAMAGE THE BOARD.

HEATER SUPPLY SIDE CONNECTION

FOR MODELS RATED **5KW** THRU **l1KW**, ONE PAIR OF WIRES SHOULD BE ATTACHED WITHIN THE UNIT AT POWER CIRCUIT 1 (CKT 1)-ONE WIRE TO L1 AND ONE WIRE TO L2. FOR MODELS **14KW** THRU **22KW**, A SECOND PAIR OF WIRES MUST ALSO BE ATTACHED AT POWER CIRCUIT 2 (CKT2)-ONE TO Ll AND ONE TO L2. FOR MODEL RATED **28KW**, A THIRD AND FOURTH PAIR OF WIRES ARE REQUIRED FOR POWER CIRCUITS 3 AND 4 (CKT 3 & CKT 4).

MAIN POWER CIRCUIT BREAKER



WHERE REQUIRED BY CODE, USE A DISCONNECT SWITCH ADJACENT TO THE HEATER. WHEN MAKING THIS TYPE OF INSTALLATION, BE SURE THE MAIN FEEDER WIRES USED ARE PROPERLY SIZED.

Install the proper size circuit breaker (see Product Specifications). Be sure that the unit-to-power supply circuits are properly connected. For models rated 5KW thru 1lKW, the pair of feeders attached to power circuit 1 (CKT 1) should be attached to one 2-pole breaker, and for models rated 14KW thru 22KW, the second pair attached to power circuit 2 (CKT 2) should be attached to a second 2-pole breaker such that the total load will be balanced. For model rated 28KW, two additional breakers are required for power circuits 3 and 4 (CKT 3 & 4).

PRE-POWER CHECK

1. After all electrical connections have been made, every effort should be made to verify a safe installation. Again check to be sure all connections in the unit disconnect and/or circuit breaker panel are secure. Check to be sure that an **adequate ground has been properly connected.** Check to be sure that adequate size breakers have been installed properly. Remember that breakers that are too large are more dangerous than breakers that are too small.

2**. RUN WATER THROUGH THE UNIT UNTIL AIR IS PURGED.**

POWER CHECK

Check only after the Pre-Power Check has been completed and the unit filled with water. Turn on the Main Power Circuit Breakers. Verify that the heater's GREEN POWER-ON indicator light is illuminated.

USE EXTREME CAUTION WHEN CHECKING VOLTAGE TO THE UNIT.

Check the voltage available to each active power circuit. **SEISCO** models rated 5KW to 28KW are designed to operate from a 208V to 240V power supply. Connect a voltmeter at power circuit 1 (CKT 1) between L1 and L2. (For models with multiple power circuits utilized, continue to check voltage at each additional power circuit.)

OPERATIONAL CHECKS

Turn water on **MEDIUM-LOW** utilizing any sink allowing water to run for a couple of minutes to ensure that all air is purged from the unit. You will hear a "click" as the relays on the circuit board engage. It is normal to hear a "hissing" or "crackling" noise from the heat exchanger after the unit is started. With the unit's cover removed, verify with an ammeter that there is ELECTRICAL CURRENT through each heating element circuit. DISREGARD THE WATER TEMPERATURE WHILE DOING THIS TEST.

TURN OFF FAUCETS after completing Operational Check.

Thermostat settings are factory preset to approximately 120 degrees F for units employing a circuit board potentiometer (thermostat).

THIS INSTALLATION MUST BE DONE BY QUALIFIED AND LICENSED CONTRACTORS. Refer to your local electrical and plumbing codes for additional information.

Start-Up Functional Checks

After the initial start-up, following the **Pre-Power** and **Operational Checks** described in the **Electrical Installation** section of this manual, it may be necessary to make adjustments to the system to insure that the heater is functional and providing hot water.

Beeps & Flashing Lights – What do they Mean?/

It is normal at start-up or any time the heater is powered-on for the control board to beep and the LED to flash red and then green. Normal status of the heater is for the control to flash all green repeatedly. The initial 2 to 4 red flashes and beeps after power-on are normal, but should not continue.

SEISCO Provides On-Board Self Diagnostics

However, in the event that the LED light continues to flash a red sequence after power-on, then there may be a need for further investigation. The heater's control provides self diagnostics by emitting a red flashing code. The code definitions and possible solutions can be found in the ***Trouble Shooting*** section of the ***Seisco Service Manual***.

Some of the most common problems discovered during installation and initial start-up are as follows:

- Circuit breakers are not turned-on (especially, heaters with multiple circuits)
- Incoming power wires to the heater are out-of-phase (heaters with multiple circuits)
- Water supply valve not turned-on, no water in the heater chamber
- Water supply lines are reversed; hot and cold reversed
- Water supply connection(s) are leaking
- T&P Relief Valve (where required by local code) is leaking or stuck open

The Seisco Heater Alerts the User of Water Leaks!

Diagnostic codes are designed to tell the installer or user if there is a problem and what the problem might be. Also, the Seisco heater has a **built in alarm** that will sound if there is water leaking onto the heater, possibly from a leaky water line connection or from a leaky T&P Relief Valve. It is **important to turn off all of the circuit breakers** to the heater whenever a leak is detected to prevent possible damage to the control board. After the leak is discovered and repaired, it is **important to dry any moisture or water accumulation** on the heater. This can be done with a standard household hair dryer or dry towels. Any attempts to dry the heater should be done with all the power off to the heater.

System Match – Faucets and Heater

When a Seisco heater is selected for the home or building, the faucets should be selected to match the flow rating and temperature rise specifications of the heater. Seisco heater specifications can be found in the ***Product Description and Specifications*** section of the Product Guide. Sometimes, this is overlooked and the user discovers that the faucets in the home are a higher flow rate than the design of the Seisco model(s) selected.

Solutions for High Flow Applications

Another oversight may be the lifestyle of the user. For instance, if the user wants to take two showers at the same time or run the washing machine and the bathtub at the same time, then the flow rate demands of the water heater are increased, sometimes beyond the capability of the Seisco heater. Multiple Seisco heaters are used for higher flow applications, such as for multiple task lifestyles, whirl pool and Jacuzzi tubs and body spa showers as well. Refer to ***Product Applications and Diagrams*** section of the Product Guide for recommended multiple Seisco heater arrangements. Note, it is **important to evaluate the electrical capacity** of the home or building when selecting multiple Seisco heaters for a high flow application. Refer to the ***Electrical Service Requirements and Sample Load Calculations*** section in the Product Guide.

Typical Flow-Use Rates in Gallons per Minute (gpm)

Fixture Type	Lavatory	Bathtub	Shower	Kitchen Sink	Pantry Sink	Laundry Sink	Dish-Washer
Flow Rates	0.8 – 1.5	2.0 – 4.0	1.5 – 3.0	1.0 – 1.5	1.5 – 2.5	2.5 – 3.0	2.0 – 3.0

Temperature Adjustment

After the Seisco heater has been installed and the operational checks are completed, the output of the hot water can be measured and adjusted if necessary. The temperature adjusting knob can be found on the left side of the control board. The factory setting is usually between 117 and 120 degrees F. The knob will usually be in the 2 to 3 o'clock position. Turning the knob to the left decreases the temperature and turning it to the right increases the temperature. Note: it is important to understand the **effects of increasing the temperature** above the factory setting as follows:

1. The heater will use more power to heat the water; energy savings are reduced.
2. There will be a greater chance that the heater will produce scaling and sediment build-up.
3. The heater may not have the power to achieve temperatures higher than factory settings.
4. Safety; with higher temperatures, there will be a higher risk of scalding and personal injury.